CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512

DATE: March 26, 2008

TO: Interested Parties

FROM: Chris Davis, Compliance Project Manager

SUBJECT: Kern River Cogeneration Company Project (KRCC) (82-AFC-2C)
Staff Analysis of Proposed Modifications To Dry Low NO_x Combustors To Reduce Emissions

On September 10, 2007, the California Energy Commission received a petition from Kern River Cogeneration Company to amend the Energy Commission Decision for the Kern River Power Project. Staff prepared an analysis of this proposed change. A copy is attached for your information and review.

The Kern River Power Project is a 300 megawatt, natural gas-fired cogeneration power plant located in Kern County, near Bakersfield, California. The project was certified by the Energy Commission on August 24, 1983, and began commercial operation on August 1, 1985.

The proposed modifications will allow the Kern River Power Project to install enhanced dry low NO_x combustors in Units 1, 2, 3 and 4. This would allow the facility to comply with the San Joaquin Valley Air Pollution Control District Retro-fit Rule 4703.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing Condition of Certification AQ-18**.** It is staff's opinion that, with the implementation of the revised condition, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff analysis have been posted on the Energy Commission's webpage at http://www.energy.ca.gov/siting_pre-1999_compliance/index.html. The order (if the amendment is approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the April 23, 2008 Business Meeting of the Energy Commission. If you have comments on this proposed modification, please submit them to me at the address below prior to April 9, 2008.

Chris Davis**,** Compliance Project Manager
California Energy Commission
1516 9th Street, MS-2000
Sacramento, CA 95814

Comments may be submitted by fax to (916) 654-3882, or by e-mail to CMDavis@energy.state.ca.us. If you have any questions, please contact me at (916) 654-4842.

KERN RIVER COGENERATION PROJECT (82-AFC-2C)

Petition to allow the installation of Enhanced Dry Low NOx Combustors
Air Quality Staff Analysis
Prepared by: Joseph M. Loyer
March 24, 2008

INTRODUCTION

The Kern River Cogeneration Company (KRCC) submitted a petition on September 10, 2007, to the California Energy Commission (Commission) to amend the conditions of certification to allow the installation of enhanced dry low NOx combustors in Units 1, 2, 3 and 4 at the Kern River Power Project (Kern River). This would allow KRCC to comply with the San Joaquin Valley Air Pollution Control District (District) Retro-fit Rule 4703.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

No laws, ordinances, regulations or standards will affect the petitioned amendment requests.

ANALYSIS

On August 24, 1983, the Commission granted KRCC a license to build and operate the Kern River project, a 300 MW power plant in Kern County consisting of four natural gas fired General Electric Frame 7EA combustion turbines and heat recovery steam generators (HRSGs). Each HRSG was designed to deliver 450,000 lbs/hr steam at 80% quality to the surrounding oil field for thermal enhanced oil recovery. Kern River has been in operation since August 1, 1985, delivering steam to the oil field and electric power to the grid.

Rule 4703 limits the emissions of Oxides of Nitrogen (NOx) and Carbon Monoxide (CO) from stationary gas turbines. The Kern River turbines are currently in compliance with the emission limits and monitoring requirements of this rule. KRCC has chosen to undertake what is referred to in Rule 4703 as the “Enhanced Option”, which requires NOx emissions to be controlled to 3 parts per million by volume (ppmv) @ 15% O2 by 2008 or the first major overhaul which is planned to be completed by April 30, 2008.

KRCC is petitioning the Energy Commission to allow the installation in units 1, 2, 3 and 4 of the new General Electric enhanced dry low NOx (DLN1+) combustors. These new combustors are guaranteed to control the NOx emissions from GE Frame 7EA turbines to no more than 3 ppm @ 15% O2. The District has already issued the permit to operate (PTO) for Kern River which incorporates the new, lower NOx emission rates shown in AIR QUALITY Table 1 (below). No other modifications to emission limits or equipment are requested.

AIR QUALITY Table 1
Existing and Proposed NOx Emission Limits

Existing NOx Emission Limits	Proposed NOx Emission Limits
1629.6 lbm/day	552.8 lbm/day
67.9 lbm/hr as NO2 (Nitrogen Dioxide) (3 hr rolling average)	12.4 lbm/hr as NO2 (3 hr rolling average)
16.4 ppmv at 15% O2 (3 hr rolling average)	3 ppmv at 15% O2 (3 hr rolling average)
79.7 lbm/hr (1 hour average)	Limit superseded

The NOx offsets originally provided for the Kern River project were to mitigate emissions based on the 79.7 pounds mass (lbm)/hr emission limit. The proposed emission limit of 12.4 lbm/hr averaged over 3 hours has a maximum potential of 36 lbm in any one hour. Therefore, the existing emission limit of 79.7 lbm/hr can not be exceeded with the new proposed permit limit. Thus, staff concurs with the District in determining that the 79.7 lbm/hr limit is unnecessary as the 12.4 lbm/hr limit that supersedes it is more restrictive and poses no risk of a significant impact to the ambient air quality.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed the proposed changes and concludes that there are no new or additional significant impacts associated with approval of the petition. Staff concludes that the proposed changes are based on information that was not available during the original licensing process. Staff concludes that the proposed language retains the intent of the original Commission Decision and conditions of certification. Staff recommends the following modifications to Condition of Certification AQ-18.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff has proposed modification to the air quality conditions of certification as shown below. (Note: deleted text is in ~~strikethrough~~, new text is **bold and underlined**)

AQ-18 Pollutant emissions from each combustion turbine shall not exceed the following limits except during times of startup or shutdown as defined in Condition AQ-17 **or transitional periods as defined herein**:

Gas Fired Case:

Particulates	- 5.0 lbm/hr as PM10
	- 120.0 lbm/day as PM10
Sulfur Compounds	- 0.9 lbm/hr as SOx (as SO_2)
	-21.6 lb/day as SOx (as SO_2)
	-0.6 lbm/hr as SO4
Oxides of Nitrogen	- ~~1629.6 lbm/day as NO2~~
(NOx emissions valid through April 30, 2008;	- ~~67.9 lbm/hr as NO2, 3 hour rolling average~~
	- ~~16.4 ppmv at 15% 02, 3 hour rolling average~~

then superseded by the emission limits below)	~~Not to exceed~~ - ~~79.7lbm/hr, 1 hour average~~
Hydrocarbons	-12.0 lbm/hr (Non-methane) - 288.0 lbm/day
Carbon Monoxide	-1056 lbm/day and - 25 ppmv at 15% 02 - 44.0 lbm/hr 3-hour rolling average

After April 30, 2008, the emissions of oxides of nitrogen from each combustion turbine shall not exceed the following limits (these limits are to supersede the NOx emission limits shown above):

Oxides of Nitrogen	**- 552.8 lbm/day and** **- 12.4 lbm/hr as NO2 and 3 ppmv at 15% O2 calculated on a 3 hour rolling average.**

Protocol: For nitrogen dioxide, the Kern River Cogeneration Company (KRCC) shall identify the following for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17:
(1) the daily maximum hourly mass emission rate (lbs/hr),
(2) the daily maximum rolling 3-hour average mass emission rate (Ibs/hr) and
(3) the total daily mass emissions (lbs/day).

For carbon monoxide, KRCC shall identify the total daily mass emissions (lbs/day) for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17.

For particulate matter (PM10), sulfur compounds (SO_2 and SO_4) and non-methane hydrocarbons, KRCC shall determine through the initial source test, the fuel-based emission factors (lbs/mmBtu) for each pollutant. Using these factors, KRCC shall determine the maximum allowable fuel input rate (mmBtu/hr) that would comply with the above stated emission limits (lbs/hr) (i.e., emission limit / emission factor = fuel input rate). KRCC shall then compare these fuel input rates (as determined above) with the actual daily maximum fuel input rate (mmBtu/hr) for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17.

KRCC shall submit all excess emission reports and break down reports to demonstrate compliance with all concentration limits.

A transitional period is defined as a primary re-ignition period which must meet the following three conditions:

- **shall not exceed one hour,**
- **NOx emissions shall not exceed 15 ppmvd @ 15% O2 during that hour and**
- **CO emissions shall not exceed 25 ppmvd @ 15% O2.**

Verification: KRCC shall submit quarterly emission reports with all the information identified in the above protocol to the CEC compliance project manager.